The purpose: To study the efficiency of one week nasal inhalation therapy with pulsating aerosol for optimized treatment of infectious and allergic rhinosinusitis in children. To compare this inhalative therapy with other commonly used treatments.

To compare acute effects of oxymetazolin via inhalation with pulsating aerosol and the latter application.

Effect estimated on dynamics of:
- Subjective and Objective Manifestations Scored Numerically
- The scoring was based on the following criteria:
  - Edema
  - Hyperemia
  - Nasal obstruction
  - Nasal discharge
  - Area adjacent to the ear affected
- 1 point – light short episodes
- 2 points – symptoms persisting during major part of time
- 3 points – symptoms effect on day’s activities and overnight sleeping of a child

Data were processed statistically. Group A – PARI Sinus Inhalation Therapy vs. Group 2 – conventional therapy with a combination of drugs in a single inhalation. Parameters of Respiratory Function Identified by Bronchography

Method: PARI SINUS aerosol delivery system is intended for treatment of sinus cavities, upper and lower respiratory airways. The PARI SINUS capitalizes on the positive effect of an alternating pressure wave to deposit the drug in the nasal sinuses.

Inhalation therapy with pulsating aerosol submission is applied for treatment of etiologically diverse (allergic, viral, bacterial) acute and chronic sinusitis and for treatment of associated diseases in the upper and lower respiratory tract, such as bronchitis, rhino sinusitis and asthma.

The nebulizer is especially designed in such a way that the aerosol is inhaled into the affected area while delivering the drug directly into the nasal sinuses.

As a carrier for the therapeutic substances, particulair is sucrose-based solution, which allows to use the entire potential of the PARI SINUS nebuliser. Microcrystals of sucrose are deposited in the nasal sinuses, even for young children.

Pulsating aerosol inhalation is a widely used focused solution method for drug deposition. Drug is directed directly into the affected area while maintaining the mucous membranes of nasal sinuses.

NAC solution as well as secretolitic and mucusactive substances, antibiotics and corticosteroids can be used for inhalation pulsing submitting therapy in combinations or as a single drug therapy.

Results of examinations:
- Nasal conductivity of allergic rhinosinusitis patients was evaluated by rhinometry measurements demonstrated improvement of breath through nose and increased the total airflow in 1 group on 20.7%, in 2 group on 15.2% accordingly. Deposition of Oximetazolin per inhalation makes it possible to reduce the vasoconstrictor dosage, in comparison with the use of a vasoconstrictor alone.
- According to the bronchography data a significant decrease in the bronchial permeability of the affected side is indicated, it’s correlates with improvement of the upper airways patency.
- Ability to use in a treatment a combination of drugs in a single inhalation.
- PARI SINUS inhalation is a well-tolerated and a simple procedure. In 2 group in children with allergic rhinosinusitis for 5 days of treatment the increase in a total flow of air in 1.5 times for 3-4 days and in 3 times for 7-8 days of treatment. Marked that has made in parameters of rhinometry on 17% and 50% accordingly. Rhinometry parameters increased on 17% and 50% accordingly.
- Rhinosinusitis treatment improves bronchial permeability considerably in children.

Conclusions:
- Drug delivery via PARI Sinus offers a noninvasive, painless, targeted therapy for the treatment of acute and chronic rhinosinusitis in children including preschool age.
- Why to try in a treatment a combination of drugs in a single inhalation.
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The treatment regiments via PARI Sinus used in this study showed a trend to better symptom reduction compared to other common therapies

Features of PARI Sinus Inhalation
- Nebulizer aerosol delivery
- Aerosol deposition in the paranasal sinuses
- Suitable for all nebulizer – specific medications

Aerosol characteristics
- TQI (Total output rate) – 220 mm/s
- MMD (Most mass median) – 3.2 µm
- Mass percentage under 5% – 71% of aerosol
- Frequency of pulsation – 44 Hz

110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260
0 0,1 0,2 0,3 0,4 0,5 0,6 0,7 0,8 TQI (m/s)

Parameters of Respiratory Function

In Group 2A of children with allergic rhinosinusitis by Day 3 of therapy rhinomanometry measurements demonstrated improvement of breath through nose and increased the total air flow in 1 group on 20.7%, in 2 group on 15.2% accordingly. Deposition of Oximetazolin per inhalation makes it possible to reduce the vasoconstrictor dosage, in comparison with the use of a vasoconstrictor alone.

After 7 days treatment nasal breathing was improved in 5-12.6 kHz.

Patient’s Complaints:
- Restricted breathing (more on the left side), sensation of pressure and facial pain, purulent rhinorrhea.

Objective data: nasal obstruction and congestion, to a greater extent on the left side, purulent rhinorrhea from the left meatuses, hyperemic and congested nasal mucous membrane.

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